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Australian Canoes and Rafts

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## AUSTRALIAN CANOES AND RAFTS.

BY N. W. THOMAS, M.A.

[WITH PLATES X-XII.]

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ALONG a large part of the south and west coasts the natives of Australia seem to have possessed no means of conveyance by water. From the mouth of the Murray westwards, canoes were unknown, and Kangaroo Island and the smaller archipelagoes seem to have been untrodden by the foot of man before European days. On the west coast the raft is recorded at the mouth of the Gascoyne River and on Babbage Island, just off the mouth; in the former case it is highly probable that it was an up-river and not a coast product; in the latter case only a fragment of uncertain origin but similar type was found. It is recorded that in the western and southern area not only the art of navigation but even that of swimming was unknown to the natives.<sup>1</sup>

<sup>1</sup> 53, 432; 44, ii, 10, 169; 28, ii, 137; 55, i, 33; 39, 142, 204.

The numbers in Clarendon refer to the Bibliography on p. 77.

Australian canoes fall into two main types, the bark canoe and the dug-out, each of which, like the raft, has two or more genera and several species. To these two types correspond four main areas, two of bark canoes, including Victoria, New South Wales, Queensland up to about  $17^{\circ} 8'$ , together with the Gulf of Carpentaria, the Adelaide River and the Coburg Peninsula; the dug-out canoe is found in the Cape York peninsula,<sup>1</sup> at Port Essington and possibly the Gascoyne River (?), the north coast, and in two isolated areas in South Queensland and New South Wales: while the catamaran, or its simplest form, the log, is the means of conveyance by water from Paterson Bay westwards as far as Roebourne, and sporadically in the south-west of the Gulf of Carpentaria and on the Lower Murray. Along the west coast, and on the south coast as far east as Adelaide, there seem to have been no means of transportation by water, and, according to some authorities, the art of swimming was unknown.

A. *Bark canoes.*—The bark canoes fall into two classes, those made of a single sheet of bark and those which are built up of two or more pieces. The single-sheet type is found in Victoria (Fig. 1; Pl. X, Fig. 1),<sup>2</sup> the Riverina,<sup>3</sup> and the south of New South Wales (Pl. XI, Fig. 4);<sup>4</sup> King saw one in lat.  $18^{\circ} 50'$ , and at Gould Island ( $18^{\circ} 10'$ )<sup>5</sup>, not far from the southern boundary of the dug-out. Curr<sup>6</sup>

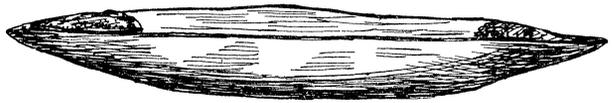


FIG. 1.

Victoria.

records this type at Halifax, Kennedy<sup>7</sup> at Guyanda Creek, and King and others at Port Essington,<sup>8</sup> and on the Alligator River.<sup>9</sup> At Munro, Victoria, a transition form has been found, the stem of large canoes being formed by a semicircular piece.<sup>10</sup>

The second type of bark canoe is built up of two or more pieces; this form is found at Breaksea Spit ( $24^{\circ} 28' S.$ ), Murray Island ( $20^{\circ} 48' S.$ ) and Rockingham Bay (?) on the East Coast.<sup>11</sup> On the islands of the Gulf, inside the barrier reef and at Saltwater Bay ( $23^{\circ} S.$ )<sup>12</sup> the main part of the boat consists of three pieces, two for the sides and one for the bottom. A variant of this is found at Blue Mud Bay ( $136^{\circ} E.$ ) in the Gulf,<sup>13</sup> where two pieces only are used, with the seam on one side. In Pellew's Islands, ( $137^{\circ} E.$ )<sup>14</sup> in the Gulf, a built-up canoe is also found, but in this case it is clinker built, formed of many pieces sewn together. The Anula canoe is formed of three main pieces with two small ones at the stern and two at the stem.<sup>15</sup> At Frazer's Island ( $25^{\circ} S.$ ) we find a canoe made of bark "tied

<sup>1</sup> Dr. Howitt says it has now spread as far south as Hinchinbrook Island ( $18^{\circ} 30'$ ), but it was found further south by Macgillivray in the forties and has therefore not gained ground in the last sixty years. <sup>2</sup> 57, vi, 22; 16, 139; 45, ii, 201; 18, 43. <sup>3</sup> 35, 336; 34, i, 220; 4, 64. <sup>4</sup> 46, 81; 47, 193; 37, 135; 53, 363, 432; 49, 92; 16, 107; 20, ii, 153; 19, 150; 28, i, 175. <sup>5</sup> 28, i, 198, 200; cf. 32, i, 87. <sup>6</sup> 8, iii, 427. <sup>7</sup> 25, 194. <sup>8</sup> 28, i, 90; cf. 32, i, 146; 8, i, 269; 44, i, 412 (possibly sewn bark); 27, ii, 183. <sup>9</sup> Model in Pitt Rivers Mus., Oxford. <sup>10</sup> 41, i, 411. <sup>11</sup> 52, xxvii, 156; 10, p. 14; Jukes in 53, 331; but cf. 24, i, 93, and 6, p. 16, where the sewing is not mentioned; and see 12, iii, 95. <sup>12</sup> 54, xiii, 288; *ib.*; 31, 316. <sup>13</sup> 14, ii, 198. <sup>14</sup> *ib.* 171. <sup>15</sup> 42, p. 679.

together with ropes,"<sup>1</sup> but it is not clear what this means. At Port Denison (20° S.) (Pl. XII, Fig. 2) on the Batavia (13° 30' S.) and Adelaide Rivers (131° 30' E.) and at Coburg Peninsula (133° E.)<sup>2</sup> the sewn bark type is found but none of the authorities give definite information by which we can decide the exact type. The paddle canoes of the Goulburn Islands (133° 30' E.) are probably of bark.<sup>3</sup>

Bligh records finding a canoe 33 feet (10 m.) long at Sunday Island (11° 45' E.)<sup>4</sup> made of three pieces, the bottom entire, to which "the sides were sewn in the common way," but there is nothing to show that this was a bark canoe, though, if it were Australian, it is difficult to suppose that it was not. The extraordinary feature, however, of a carved projecting bow, with a rude fish figure-head, seems to exclude bark as the material.

Turnbull<sup>5</sup> speaks of the canoes of New South Wales as "composed of the bark of trees tied together in small splinters"; but this assertion is unsupported. McMinns,<sup>6</sup> however, reports from the Adelaide River a canoe of Melaleuca bark, formed of several layers to a thickness of 9 inches (22·8 cm.). One end was pointed and fastened by wild vine lashing; the other was about 4 feet (1·21 m.) broad. The whole was more like a raft than a canoe. It was 16 feet (4·9 m.) long and large enough for ten persons.

Equally unsupported is Tasman's statement that at Carnot Bay (17° 12' S. : 121° E.) "these proas are made of the bark of trees."<sup>7</sup> He probably mistook the raft of unbarked timber for a bark canoe.

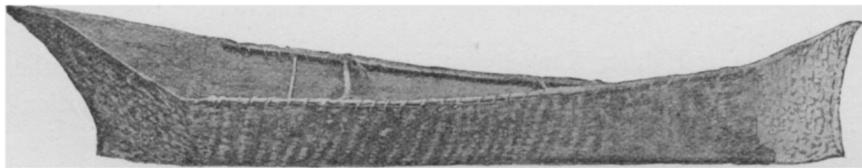


FIG. 2.

The canoes of the single sheet type are divisible into four species distinguished by the four ways in which they are finished off: these are (a) by tying the ends; (b) by lacing or sewing them; (c) by skewering them sometimes with a lashing to make sure; (d) and by blocking the ends with clay.

An indeterminate type is described from this bend of the Murray and stated to be "very different from the coast canoes." It was round at both ends, 14 feet by 2½ feet (4·3 m. by 76 cm.) in length and beam, and the gunwale was 1 inch (2·5 cm.) high at the stem, 6 inches or 15 cm. at the bow.<sup>8</sup>

(a) This is found in New South Wales (Pl. XI, Fig. 4), at Port Jackson, King's River, Pumicestone River, and in latitude 34° 6',<sup>9</sup> in Victoria near Grant and Munro.<sup>10</sup>

(b) is found at Port Essington, on the Alligator River (Fig. 2) in latitude 18° 50' 15'', at Halifax Bay (18° 30'), on the Johnstone River (17° 30')<sup>11</sup> in New South Wales (locality not stated).<sup>12</sup>

<sup>1</sup> 55, xv, 314. <sup>2</sup> 8, iii, 4; 44, i, 312; 59, v, 308; 56, 1881, 229; 8, i, 273; 11, xxiii, ii, 350.

<sup>3</sup> 58, 396. <sup>4</sup> 5, 210. <sup>5</sup> 49, 92. <sup>6</sup> 51, xliii, 175. <sup>7</sup> 44, i, 89. <sup>8</sup> 22, p. 232.

<sup>9</sup> 28, i, 175; 7, ii, 255; 37, 135. <sup>10</sup> 41, i, 411. <sup>11</sup> For refs. see above. <sup>12</sup> 53, 363.

- (c) is found in New South Wales (locality not stated),<sup>1</sup> and  
 (d) along the south coast, at Western Port, on the Murray (140°–141°),  
 in the Wellington district,<sup>2</sup> and on the Yas<sup>3</sup> (Fig. 1).

*Trees used.*—According to Howitt,<sup>4</sup> the best trees are :—

- (1) Mountain ash<sup>5</sup> (= iron bark), which is tied, but not turned inside out.
- (2) Stringy bark (Dibil palm) (see below for method of use).
- (3) Red gum (= *E. rostrata*) which is also tied, but not turned.
- (4) Blue gum (*ballook*) which is tied and turned.
- (5) White gum of river valleys.  
     Snowy River mahogany.
- (6) Peppermint (“no good”); thin yellow-barked stringy bark (*yert chuck*); the good kind is *yam goura*.

Other authorities merely say that gum tree bark is used without specifying the species.

*Preparation of bark.*—Howitt gives the following description of the method of preparing a canoe on the Snowy River.<sup>6</sup> A stringy bark tree was chosen with straight bole, free from branches and knots and about 4 feet (1·2 m.) in diameter at the butt. It was ascertained by taking a chip of bark out with the tomahawk that it would strip freely. Two straight saplings,<sup>7</sup> about 10 feet in length, were cut, trimmed of their branches, and one end of each flattened, so as to be pliable. The bark was then cut round 2 or 3 feet (60–90 cm.) from the ground, and then in a straight line 10 feet upwards, the ascent being made by means of notches<sup>8</sup> in the cut itself; then an upper cut was made.

The black then descended, worked the bark partly free with the axe blade and inserted the blade of one sapling; running this upwards he separated the bark for some distance, and left the pole to spread open the bark; he then went on to do the same with the other sapling till only the upper rim of the sheet remained fast. Taking hold of the sheet two men now lowered it to the ground, laying it smooth side downwards, so that the old outer bark could be cleaned off, and only the brown under bark and fibrous inner layer remained; the brown inner bark was further removed to a distance of 2 feet (60 cm.) from each end.

A fire was then made and the bark well steamed over the flame. As soon as it was pliable it was turned inside out; the sides were then doubled up, secured with ties passed through three holes in each edge, the cords being made of twisted strands of the fibrous inner bark.

One end was next reheated, and folded together fan-wise; the folds were squeezed together and bitten to make them hold; and a lashing 1 foot (30 cm.) in

<sup>1</sup> *Ib.*

<sup>2</sup> For refs. see above.

<sup>3</sup> **3**, i, 169.

<sup>4</sup> **41**, i, 411.

<sup>5</sup> **8**, iii, 4.

<sup>6</sup> **41**, i, 408.

<sup>7</sup> This was replaced by the *katta* (digging stick) when the camp was at hand;

**57**, v, 170.

<sup>8</sup> A notched sapling served as a ladder in New South Wales; **47**, p. 98.

length put on. The other end having been similarly treated, struts were put in to hold the sides apart. These were pointed sticks the exact width of the canoe, the points being inserted in the same holes as the ties. Finally pliable branches were forced under the ties to serve as ribs and the canoe was ready.<sup>1</sup> Its total length was about 10 feet (3 m.).

On the Darling and in the Riverina the red gum was used, and a sheet taken off by preference at a bend.<sup>2</sup> Possibly this kind was for temporary use only.<sup>3</sup>

Near Munro, Victoria,<sup>4</sup> an elliptical sheet was preferred, which was laid on the fire till it doubled up in the shape of a cigar-shaped canoe.

Among the Bangerang<sup>5</sup> a river gum was selected, some 20 feet (6 m.) in circumference. Notches outside the line or a stout branch served as a means of ascent. The bark was hammered, if the sap was not up, with the butt of an axe to take it off, and a rope was slipped round the sheet to prevent it from falling heavily. It was then turned upside down on a fire, two or three ribs were inserted and a log placed under the bow to mould it. In a day or two it was set and ready for use.

The Wathi-Wathi (?) used red-gum bark, with struts at 3-foot intervals. Props were placed under the bow and stern and, if necessary, heavy billets of wood inside to shape it. Well puddled clay was smeared over the inside, and in ten days or so it was ready for use and would last a couple of years.<sup>6</sup>

There is but little information as to the method of constructing sewn bark canoes, save what we learn from Spencer and Gillen.<sup>7</sup>

"Amongst the central tribes boats are, very naturally, quite unknown, for the simple reason that it is only very rarely indeed that there is sufficient water in the creeks to render a boat of any service. At the same time it is curious to note the striking resemblance in form between some of the *pitcheis* and boats.

"The true indigenous Australian boat has the form represented in Pl. X, Figs. 2-5. This particular one measures 17 feet (4.5 m.) in length, slightly more than 4 feet (60 cm.) in beam, and has both ends raised, the bow being higher than the stern. There is no attempt to form a keel. The bark is derived from some species of gum-tree which easily peels off in long broad strips. The outer rough portion is scraped off, and it is then ready for use. In the case of the one drawn there are seven pieces of bark. Two narrow strips form the upper part of the bow on each side, and two smaller pieces the upper part of the stern. These are sewn on to the three remaining pieces which form the main part of the boat. One of them extends along the whole length of its side from bow to stern, and, save for a short distance at either end, from bulwark to where the keel ought to be. The two others form the opposite side of the boat—the near one in the drawing. These three strips are firmly sewn together along the bow, stern, and keel, and up one side. Along the bulwarks, but not extending quite to either end, runs a thin long branch of mangrove wood securely tied on to the bark. For the purpose of

<sup>1</sup> It does not seem to have been an invariable practice to turn the stringy bark, 41, i, 411; 20, ii, 153, etc.      <sup>2</sup> 41, i, 410.      <sup>3</sup> *Ib.* 407.      <sup>4</sup> *Ib.* 411.      <sup>5</sup> 9, 89.

<sup>6</sup> 4, 64.      <sup>7</sup> 42, p. 679.

preventing the sides from collapsing outwards there are nine "ties" of rope passing across from side to side, arranged as in the figure. This rope is made out of the inner fibrous part of the bark of various trees, or out of the leaves of the screw pine torn into shreds. As a general rule it consists, like the greater part of the native twine, of two plies only, but every now and again it has three. Two of these ties serve, as it were, to pinch in the extreme of the bow and stern. To prevent the sides from collapsing inwards three stout sticks are arranged at the level of each "tie" rope, as shown in the section, one passing across immediately under the tie rope from side to side, the other two slanting across from immediately under the horizontal piece to rather more than half-way down on the opposite side of the boat. Extra pieces of bark are laid along the bottom of the boat, partly to afford additional strength where the crosspieces press against the side, and partly to afford a dry floor under which the small amount of bilge water which percolates through the keel line can collect.

"The particular one here figured belonged to, and had been made by, men of the Anula tribe, and when we secured it, had just been brought across from the Pellew Islands and up to the MacArthur River for fifty miles. Though sheltered to a certain extent by the islands, there is yet a considerable stretch of the open sea between the latter and the mainland, but in a boat of this size six or eight natives will cross, some of them paddling, while others are baling out any water which may leak in or splash over."

With their account may be compared the description of a similar type from the Gulf.<sup>1</sup> "These sheets of bark, cleaned of the outer, rough covering, are pointed at each end and bored with holes along the edges for sewing together. One sheet forms the bottom, the others the sides and ends. A piece of filling or roll of grass is sewn between the edges to strengthen and fill up the seams. The inner bark forms the outside of the canoe. Rims of tough bands are round the gunwale . . . a cord across the centre keeps it from spreading and a piece of wood at each end keeps the sides apart."

On the Alligator River (132° 30' E.) a curious form is found (Fig. 2) with sewn ends and strengthening pole along the gunwale. The gunwale has a strong overhang at bow and stern, the forepost and sternpost are curved.

*Ribs.*—The descriptions are as a rule vague, and it is not always easy to make out the exact meaning of the terms. The ribs mentioned above are variously denominated. At Western Port, Grant<sup>2</sup> says he found a canoe "framed with timber." As the ends were open it is not easy to see the purpose of this, but possibly, as the canoe was broken, the lashings had disappeared. Among the Anula both ribs and struts are used.<sup>3</sup> Sir D. Cooper<sup>4</sup> speaks of a "stretcher," but perhaps not in the same sense, for if King's account<sup>5</sup> of the Port Essington canoes is correct, this term seems to have been more correct than rib, for "in the bottom of the canoe short pieces were placed crossways" in order to increase its strength, an

<sup>1</sup> 54, xiii, 288.<sup>2</sup> 16, 139.<sup>3</sup> 42, 682.<sup>4</sup> 53, 363.<sup>5</sup> 28, i, 90.

arrangement which differs considerably from the ribs described. "Stretchers" are mentioned as being used at Lake Tyers, but they were probably struts.

*Struts.*—More frequently crosspieces were inserted, as we have seen above, to keep the sides apart. Parkinson<sup>1</sup> saw them in lat. 34° 6'. They were also used in the Wellington District,<sup>2</sup> at Saltwater Bay,<sup>3</sup> at M. Island,<sup>4</sup> at Rockingham Bay,<sup>5</sup> on the Johnstone River,<sup>6</sup> among the Anula,<sup>7</sup> and in the Gulf.<sup>8</sup> Daniel Cooper,<sup>9</sup> Henderson,<sup>10</sup> and Freycinet<sup>11</sup> also mention them as being used in New South Wales without specifying the locality.

*Ties.*—These are apparently less frequent. Freycinet figures a New South Wales canoe with them, but no other mention seems to be made of them in connection with single sheet canoes. Flinders speaks of the Blue Mud Bay canoes being spanned in five places with creeping vine to preserve the shape and strengthen the canoe; this apparently refers to ties. Among the Anula nine ties of bark or screw pine leaves are used.<sup>12</sup>

*Lacing.*—At Lake Tyers the ends were laced with vegetable fibre.<sup>13</sup> For sewing or binding the ends of the body of the canoe together we find in use at Lake Tyers<sup>14</sup> vegetable fibre, at Port Jackson<sup>15</sup> vines, and in New South Wales<sup>16</sup> (locality not stated) stringy bark; in lat. 25° bark rope was used,<sup>17</sup> at Saltwater Bay<sup>18</sup> wood fibre, at M. Island<sup>19</sup> a cane-like creeper, in lat. 18° 50' *flagellaria indica*<sup>20</sup> and at Rockingham Bay *calamus Australis*.<sup>21</sup>

The *flagellaria* was used at Port Essington for a similar purpose.<sup>22</sup> In New South Wales sinew is said to have been used.<sup>23</sup>

*Pins.*—The only notice of accessory parts in a bark canoe we owe to Grant,<sup>24</sup> who mentions that there were two or three wooden pins in the bows of the New South Wales canoes, probably to carry fish, pigs or spears.

*Gunwale.*—In some districts a strengthening pole was lashed along the gunwale; Sir D. Cooper mentions a rush lacing in New South Wales,<sup>24</sup> Carron found the pole at Rockingham Bay,<sup>25</sup> Spencer and Gillen among the Anula,<sup>26</sup> Flinders at Blue Mud Bay,<sup>27</sup> King at Port Essington,<sup>28</sup> and Edge-Partington on the Alligator River.<sup>29</sup>

*Caulking.*—In New South Wales,<sup>30</sup> and parts of Victoria,<sup>31</sup> mud was used for stopping the cracks. At Lake Tyers,<sup>32</sup> Port Denison,<sup>33</sup> and Blue Mud Bay<sup>34</sup> the caulking was done with gum. Grass was used for the seams in the Gulf.<sup>35</sup>

*Painter and Mooring Pole.*—King mentions the use of a painter for bark canoes at Port Essington<sup>37</sup>; in New South Wales during fishing operations the canoe was fixed to the river bank by a long stick, round which the women (whose

<sup>1</sup> 37, 135.<sup>2</sup> 19, 150.<sup>3</sup> 31, 316.<sup>4</sup> 10, 14.<sup>5</sup> 53, 331.<sup>6</sup> 12, iii, 95.<sup>7</sup> 42, 682.<sup>8</sup> 54, xiii, 288.<sup>9</sup> 53, 363.<sup>10</sup> 20, ii, 153.<sup>11</sup> 15, ii, 782.<sup>12</sup> *Loc. cit.*, 14, ii, 171; 42, 682.<sup>13</sup> 41, i, 408.<sup>14</sup> 41, i, 408.<sup>15</sup> 46, 81; 47, 193.<sup>16</sup> 53, 363.<sup>17</sup> 55, xv, 314.<sup>18</sup> 31, 316.<sup>19</sup> 10, 14.<sup>20</sup> 28, i, 198.<sup>21</sup> 28, i, 90.<sup>22</sup> 32, ii, 126.<sup>23</sup> 40, 224.<sup>24</sup> 53, 363.<sup>25</sup> 6, 16.<sup>26</sup> 42, 682.<sup>27</sup> 14, ii, 198.<sup>28</sup> 28, i, 90.<sup>29</sup> MS. note.<sup>30</sup> 20, ii, 153.<sup>31</sup> 41, i, 410, 411.<sup>32</sup> *Ib.* 408.<sup>33</sup> 8, iii, 4.<sup>34</sup> 10, ii, 198.<sup>35</sup> 54, xiii, 288.<sup>36</sup> 16, 107.<sup>37</sup> 28, i, 89.

province it was to fish with hook and line) passed one arm to steady the canoe. A painter and mooring pole were used at the head of the Murray.<sup>1</sup>

*Hearth.*—It was the custom to keep a fire in the canoe, and to boil, or half-warm the fish as soon as they were caught. The fire was in the centre of the canoe on a hearth of earth, ashes, mud, clay, stone, seaweed or sand. Collins mentions that many of the women showed signs about the small of the back of having sat too close to the fire.<sup>2</sup>

*Bailer.*—The canoes naturally ship a good deal of water, and are in addition possibly leaky. We find, therefore, that various appliances are used for bailing. At Lake Tyers the scoop-shaped pieces of bark (*wrail*) which served as paddles did duty as bailers also<sup>3</sup>; and King<sup>4</sup> found that the pieces of bark, 5 or 6 inches long, in use at Goold Island (18° 10') also served a double purpose. At Jervis Bay (35° 5') Grant<sup>5</sup> records the use of a small calabash, with which they threw out the water shipped by means of a backward motion of the other hand and without turning their heads, when they paddled with their hands. At Saltwater Bay (23°) and M. Island (20° 48') and in the Gulf shells were in use for the same purpose.<sup>6</sup>

*Dimensions and Capacity.*—The dimensions of the single sheet type are naturally determined by the possibility of detaching and moulding bark of sufficient size, and their usual length does not seem to exceed 12 or 14 feet, though 18 and 20 feet canoes are recorded, and they may be as small as 5 feet in length. The following table shows the variations<sup>7</sup> :—

District.	Dimensions.	Capacity.
Victoria ... ..	7' 6'' (2·3 m.) ... ..	2 men.
„ ... ..	8' (2·4 m.) ... ..	3 „
„ ... ..	10'—12' (3 m.—3·7 m.)	4 „
Bangerang ... ..	18' × 2½' × 8'' (5·5 m. × 76 cm. × 20 cm.)	5 „
The Moira ... ..	20' (6 m.) ... ..	5—6 men.
Gippsland ... ..	— —	6—10 men.
New South Wales ...	12' (3·6 m.) ... ..	bullock plough.
New South Wales, } Murray ... ..	large ... ..	boxes, etc.
New South Wales, } Murray ... ..	15' × 3' × 8'' (4·5 m. × 90 cm. × 20 cm.)	7—8 men.
New South Wales, } Murray ... ..	14' (3·6 m.) ... ..	4 „
New South Wales, } Murray ... ..	? ... ..	2 „ (5 as ferry).
New South Wales, } Murray ... ..	? ... ..	3 „

<sup>1</sup> 22, 232.      <sup>2</sup> 47, 193; 38, ii, 293; 18, 43; 48, 98; 53, 363; 7, i, 557.      <sup>3</sup> 41, i, 408.

<sup>4</sup> 28, i, 200; cf. 32, i, 87

<sup>5</sup> 16, 107.

<sup>6</sup> 31, 316; 10, 14; 54, xiii, 288.

<sup>7</sup> 41, i, 411.

District.	Dimensions.	Capacity.
New South Wales, } Lake Macquarie }	— —	9 men.
New South Wales, } Wellington Dist. }	6' × 2½' (1·8 m. × 76 cm.)	2 „
Port Denison ...	9' (2·76 m.) ... ..	—
Queensland, Saltwater } Bay (18° 50') ... }	8' (2·4 m.) ... ..	2 „
Queensland (18° 10')	5' (1·5 m.) ... ..	2 „
Queensland (17° 58')	5' × 1½' (1·5 m. × 45 cm.)	1 or 2 men.
Queensland, Endeavour River ... }	— —	1 or 2 „

The sewn bark type is, as a rule, larger, but here, too, considerable variation is found:—

District.	Dimensions.	Capacity.
M. Island (20° 48')... }	8' × 3½' × 20'' (2·4 m. × 1·06 m. × 50 cm.)... }	—
16° S. : 136° E. ...	? × 2' (60 cm.)... ..	—
— —	? ? ... ..	4—5 men.
13° 15' S. : 136° E.... }	13½' × 2½' (4·12 m. × 76 cm.) ... .. }	6 men.
Anula Tribe ...	17' × 2' (5·2 m. × 60 cm.)	6—8 men.
Port Essington ...	20' (6 m.) ... ..	—
„ „ ...	18' × 2' (5·5 m. × 60 cm.)	8 men.
Adelaide River ...	15' × 2' (4·5 m. × 60 cm.)	—

*Propulsion.*—In shallow water the canoes were sometimes poled. Eyre and Sturt record this method on the Murray,<sup>1</sup> King at Goold Island and King's River<sup>2</sup> (31° 30'), and Brough Smyth in Victoria.<sup>3</sup> We have already seen that the hand was used at Jervis Bay. As an alternative they made use of an oval piece of bark.<sup>4</sup> More often two scoops (*wrail*) or pieces of bark were used, one in each hand.<sup>5</sup> Other authors mention the use of two paddles without saying of what materials they were made.<sup>6</sup> Single paddles of wood were used at Bateman's Bay, New South Wales, and Dawson figures a piece of wood used (on alternate sides) as a paddle at Port Stephens, which is in shape like a wommerah, but too short to be used for such a purpose.<sup>7</sup> Elsewhere in New South Wales the wommerah was actually put to this use, and the description of a paddle, used on the Lower Murray, "which has hooked grains at one end made of kangaroo leg-bones," suggests a similar combination of functions.<sup>8</sup>

<sup>1</sup> 13, ii, 313; 45, ii, 201.

<sup>2</sup> 28, i, 200, 170.

<sup>3</sup> 41, i, 408.

<sup>4</sup> 16, 107.

<sup>5</sup> 41, i, 408; 28, i, 200; 6, 16; 15, i, xxiii.

<sup>6</sup> 37, 135; 53, 363.

<sup>7</sup> 47, 98; 60, 79.

<sup>8</sup> 57, vi, 22; but from 4, 63, it seems to be a spear, used for poling in shallow water, cf. 1, i, 54.

On the Murray<sup>1</sup> Beveridge and Eyre found the spear, dipped each side alternately, in use as a paddle, by which is perhaps meant the fishgig, 10 to 16 feet (4·9 m.) long. Mitchell found fish-spear paddles in lat. 145° 50' on the Darling, and Sturt mentions that the 10-foot spears found on the Murray between lat. 140° and 141° were also used both as poles and paddles.<sup>1</sup> Collins records the spear-paddle at Glasshouse Bay.<sup>2</sup> As a substitute for the spear a long pole is used in Victoria, at Saltwater Bay and in New South Wales.<sup>3</sup> The Anula have a paddle apparently 4 to 5 feet (1·2 to 1·5 m.) long with an oval blade two-fifths of the length; and at M. Island paddles were found ornamented with red paint. At Rockingham Bay Jukes saw long wooden paddles with diamond-shaped blades like those of Torres Straits.

*Position.*—In Victoria the sitting position was adopted for deep water (though Howitt states that the canoe-man stands in rough weather); at Bateman's Bay in New South Wales the attitude was a curious one; the canoe-man sat on his haunches, his right leg under him, and his left knee drawn up to his shoulder; the right hand held the wommera-paddle, the left a wooden paddle, and the fish spear was in front of him. The standing position is mentioned by Mitchell (Darling) and by Beveridge and Eyre<sup>4</sup> (Murray). Henderson mentions both standing and kneeling positions.<sup>5</sup> Dawson<sup>6</sup> says that at Port Stephen they kneel on a bark cushion. Sir D. Cooper<sup>7</sup> says that the paddler was in the stern and the fisherman in the bow. But the most lengthy account is that of Tench<sup>8</sup>; he says that the canoe at Port Jackson was assigned to the women. When one of them paddled to the fishing ground, she placed her child on her shoulders; it entwined its legs round her neck and hung on by her hair. She then dropped on her knees in the middle of the canoe, sitting on her heels and jamming the knees against the side for steadiness. The cross-legged position seems to have been known on the Murray.<sup>8</sup>

*Safety.*—At Port Essington Keppel<sup>9</sup> reports that the canoes were easily upset. But Mitchell<sup>10</sup> regards the single sheet canoes as very safe, and Eyre<sup>11</sup> says that they were so steady that a man could climb in. In rough weather they seem to have been beached broadside on, if a confused passage in Brough Smyth<sup>12</sup> can be relied on. In the Gulf they were safe in a moderate sea and the blacks could climb in and out of the water.<sup>13</sup> Thompson<sup>14</sup> records that the Bateman's Bay blacks go as far as Tollgate Island, and Brough Smyth<sup>15</sup> mentions that four men went in the large canoes between French Island and the mainland. Tench<sup>16</sup> also states that the Port Jackson natives navigated the open sea, to a distance of several miles, but Peron<sup>17</sup> says they did not leave the neighbourhood of the shore.

*Speed.*—Tench and Grant are the only authors to allude to the speed. They speak of it as considerable.

<sup>1</sup> 13, ii, 313; *ib.* Pl. IV, 3; 34, i, 220; 45, ii, 201; 7, ii, 238.      <sup>2</sup> 41, i, 411; 31, 316; 20, ii, 153.      <sup>3</sup> 12, iii, 95; 42, 682; 10, 14; 24, i, 93; 41, i, 408; *ib.* 411; 48, 98.  
<sup>4</sup> 4, 63; 45, i, 223; 13, ii, 313.      <sup>5</sup> 20, ii, 153.      <sup>6</sup> 2, 79, *cf.* 15, ii, 782; 19, 150.  
<sup>7</sup> 53, 363.      <sup>8</sup> 47, 193; 13, ii, 362.      <sup>9</sup> 27, ii, 183.      <sup>10</sup> 35, 336.  
<sup>11</sup> 13, ii, 313.      <sup>12</sup> 41, i, 411.      <sup>13</sup> 54, xiii, 288.      <sup>14</sup> 47, 98.      <sup>15</sup> 41, i, 412.  
<sup>16</sup> 46, 81.      <sup>17</sup> 38, ii, 293.

*Transport of Canoe.*—The canoe was in some cases carried on the head.<sup>1</sup>

*Number.*—Mitchell saw a fleet of twenty-four canoes on Lake Boga (35° 19'); another author says that each male adult owned a canoe; by Governor Phillip as many as fifty were seen drawn up on the shore.<sup>2</sup>

## B. DUG-OUT.

*Dug-out types.*—The dug-out canoes of Australia are divisible into two main classes: (1) the simple type found (a) in South Queensland and the north of New South Wales<sup>3</sup>; (b) on the Gascoyne River and possibly in the Coburg peninsula<sup>4</sup>; and (c) a Malay type west of the Gulf<sup>5</sup>; (2) the type with one or two outriggers, of large size and seagoing capacity, found from Cape York to Palm Island (18° 30')<sup>6</sup> and at the mouth of the Batavia River.<sup>7</sup>

*Trees used.*—(a) In the Bunya Mountains, according to Leichardt, they made little canoes of “the stringy bark tree which they call the Dibil palm.”<sup>8</sup> This may possibly be a bark canoe, as the material is, as we have seen, commonly used from this tree. In the Blue Mountains (34°: 150°) the Curriyong tree (? *Hibiscus heterophyllus*) was used<sup>9</sup> and Angas speaks of boats made out of tree trunks in the north of New South Wales.<sup>10</sup>

(b) Gregory<sup>11</sup> records the use of a sort of sycamore for canoes (? raft) on the Gascoyne, and one authority speaks of a small dug-out at Port Essington, which was not derived from the Malays.<sup>12</sup> Edge-Partington<sup>13</sup> figures dug-outs from Adelaide River which seem to show foreign influence, though not necessarily Malay. A dug-out from Wessel Islands is shown in an oil picture at the rooms of the Geographical Society (Pl. XI, Fig. 8).

(c) King<sup>14</sup> saw, at Goulburn Island, a teak canoe 17 feet (5·2 m.) long by 2 feet (60 cm.) beam, probably obtained from the Malays. Stokes,<sup>15</sup> Curr,<sup>16</sup> and Spencer and Gillen<sup>17</sup> report that dug-outs are obtained from the Malays. The latter authorities give 20 feet (6 m.) by 3 feet (9 cm.) as the size. The statement (? taken from Gregory) of Knight that canoes are used in North-West Australia is unreliable.

(2) At Cape York a silk cotton tree (*Bombax*) or *Erythrina* is commonly used,<sup>18</sup> and King<sup>19</sup> mentions the latter as the material at Weary Bay and Endeavour River. Jardine<sup>20</sup> also mentions a cotton tree (*Cochlospermum*) as being in use at Cape York.

*Construction, floats and booms.*—At Cape York a tree was felled and hollowed where it lay and dragged to the beach by means of long climbers used as ropes.<sup>21</sup> Two stout poles 14 to 20 feet long (4·3 to 6 m.) were then laid across the gunwale,

<sup>1</sup> 15, i, xxiii; 20, ii, 153; 7, ii, 145.      <sup>2</sup> 34, ii, 137, 142; 57, vi, 22.      <sup>3</sup> 1, ii, 231; 3, i, 115; cf. 30, 375.      <sup>4</sup> 29, 106, but probably erroneous; but cf. 17, 41; 53, 396.      <sup>5</sup> 28, i, 67; 44, i, 394; 12, iii, 95; 8, i, 269, 273.      <sup>6</sup> For refs. see above.      <sup>7</sup> 56, 1881, 229.      <sup>8</sup> 30, 375.      <sup>9</sup> 3, i, 115.      <sup>10</sup> 1, ii, 231; 50, 1858, 56.      <sup>11</sup> 17, 41, 56, iii, 22.      <sup>12</sup> Brierley in 53, 396.      <sup>13</sup> 12, iii, 95.      <sup>14</sup> 28, i, 67.      <sup>15</sup> 41, i, 394.      <sup>16</sup> 8, i, 273.      <sup>17</sup> 42, 680; 29, 106.      <sup>18</sup> 32, ii, 16.      <sup>19</sup> 28, i, 220, 225; ii, 14.      <sup>20</sup> 23, 83.      <sup>21</sup> 32, ii, 16.

6 to 10 feet (1·8 to 3 m.) apart, and lashed there. The ends of these were lashed and pegged to two long floats of light wood, pointed and slightly turned up at the ends.<sup>1</sup> One authority says one side was raised by a board lashed on with rattan, and that the canoes are bartered from the islanders.

At Cape Direction<sup>2</sup> the log was well hollowed out and the top sides tumbled well home. At both bow and stern was a projecting ledge, seen in the British Museum model from the Cairns district some 250 miles further south. The booms were laid one amidships, the other across the stern, projecting 6 or 8 feet on each side and bending down so as nearly to touch the water. The floats were flat boat-shaped pieces of wood about 8 feet long.

At Weary Bay<sup>3</sup> the greatest breadth in the bilge was 15'' (37 cm.) and the sides tumbled home so that the space between the gunwale was 6'' to 8½'' (15 to 20 cm.). The boom projected 2 feet (60 cm.) on one side only; on the opposite side the ends projected 15'' to 20'' (37 to 50 cm.) and forms a platform.

At Endeavour River the canoe was 22'' (55 cm.) in the bilge and hollowed out by fire or some blunt tool.<sup>4</sup>

In the Cairns district the canoe is nearly vertical inside, and outside retains its natural form, the projections overhang at the bow and stern, as shown in Pl. XII, Fig. 1. One outrigger only is used, as at Weary Bay; but in the present case the booms are double. They pass at the same height through the sides of the canoe and are usually secured vertically one above the other by two pegs to a log float; one of the British Museum models has five pairs, the other four. (Pl. XII, Fig. 1.)

In the north of New South Wales the canoe was hollowed by fire.<sup>5</sup>

*Outriggers.*—Two outriggers<sup>6</sup> are found at Cape York, Newcastle Bay, Bird Island (11° 50'), and Cape Direction (13°). The single outrigger<sup>7</sup> is found at Cape Flinders (14° 7'), Weary Bay (15° 55'), Cairns (17°) and in lat. 17° 12'. At Palm Islands (18° 50') the description<sup>8</sup> speaks of outriggers but it may be assumed that only one is meant.

*Platform, gear.*—At Cape York the centre of the canoe is occupied by a stage of small sticks, 12 feet in length, laid across the gunwale, and extending on each side about 3 feet beyond it; on the outside is a sort of double fence of upright sticks, used for storing away weapons and other gear.<sup>9</sup> At Newcastle Bay, east of Cape York, the stage was between the points where the outriggers cross.<sup>10</sup> At Cape Direction<sup>11</sup> the gear fence seems to have been unknown and spare paddles, booms, spears, shells, twine and fishing gear was stored in the boat, everything being fastened by a bit of line.

*Anchor.*—In the bow of the Cape Direction canoe was a coil of rope, which

<sup>1</sup> 23, 83; 54, xii, 266.

<sup>2</sup> 24, i, 106.

<sup>3</sup> 28, i, 209.

<sup>4</sup> *Ib.*, 220.

<sup>5</sup> 1, ii, 231.

<sup>6</sup> 32, ii, 16; 23, 83; 28, i, 237; 24, i, 106.

<sup>7</sup> 28, i, 231, 209; 53, 304.

<sup>8</sup> 32, i, 98.

<sup>9</sup> 32, ii, 16; 41, i, 414 n.

<sup>10</sup> 23, 83.

<sup>11</sup> 24, i, 106.

possibly served as an anchor cable<sup>1</sup>; at Cape York it was often made of *flagellaria indica* and a large stone served as anchor.

*Fire*.—At Newcastle Bay, fire was invariably carried on the platform, and King saw it on this projecting end of the Weary Bay canoes.<sup>2</sup>

*Bailer*.—Shells were used as Cape Direction,<sup>3</sup> and melon husks at Cape York.<sup>4</sup>

*Dimensions, capacity.*

Cape York	...	...	15'—20' (4·6—6 m.)	—
"	"	...	45' × 3' (13·6 m. × 91 cm.)	—
Newcastle Bay	...	...	28' × 2½' (8·5 m. × 76 cm.)	—
"	"	...	50' (15·2 m.)	12—15 men.
Bird Island	...	...	16'—18' (4·9—5·5 m.)	—
Cape Direction	...	...	20' (6 m.)	—
Cape Flinders and	...	...	19' × 22'' (5·7 m. × 55 cm.)	—
Endeavour R.	...	...	10' (2·7 m.)	4 men.
Weary Bay	...	...	21' × 15'' (6'') (6·3 m. × 37 cm.)	—
? ? (Cook)	...	...	14' (4·1 m.)	—

Bligh's Sunday Island canoe has already been mentioned. If we may assume that it was a dug-out (and not in three pieces, as he states) its dimensions 33' × 3' (10 m. × 9 cm.) agree with those given above.

*Propulsion and sails*.—At Newcastle Bay a sail of palm leaf matting was used. Macgillivray<sup>5</sup> describes how the latter was set at Cape York: two poles were set up in the bows, and a longer and stouter one laid across the gunwale on the weather side, so that it projects outwards and backwards, serves as a boom. The two poles are supported by stays and guys and by a forked pole. The sails are usually two in number, 4½ feet (1·4 m.) in width by 12 feet (3·7 m.) in height, made of pandanus leaves, and pegged on each side to small poles. When they are set, they are put up on end, side by side, and travel along the backstay by means of a cane grummet. A man generally sits on the boom when it is blowing fresh. Cook<sup>6</sup> mentions that canoes were poled at Endeavour River or propelled by paddles used with two hands.

*Speed*.—The sails being in the bows, the canoes naturally make a good deal of leeway, but, when they are running free, may attain the respectable speed of seven to eight knots. The paddles used at Cape Direction were diamond-shaped, and long enough to be used by a man standing up.<sup>7</sup> Two paddles and a pole were carried at Weary Bay, and the paddlers sat in the stern. In the Cairns District and at Bird Island the paddles were bat-shaped implements, in the former case ornamented with red point at each end of the handle and blade.

*Seaworthiness*.—The Kowraregas of Cape York stand boldly out in a strong breeze.<sup>8</sup>

<sup>1</sup> *Loc. cit.*

<sup>2</sup> 23, 83; 28, i, 209.

<sup>3</sup> 24, i, 106.

<sup>4</sup> 32, ii, 17.

<sup>5</sup> 23, 3;

32, ii, 187.

<sup>6</sup> 36, 67, 71.

<sup>7</sup> 24, i, 106; 28, i, 209, 219; 32, ii, 119.

<sup>8</sup> 53, 396.

## C. LOG AND RAFT.

(a) The simplest possible form of vessel is the log, on which the voyager rides astride (Pl. XI, Fig. 6), but, even before this, comes the float or buoy on which he supports himself by resting on it his arms or chest. On the north-west coast, bundles of rushes were used for this purpose.<sup>1</sup> At Patterson Bay the men swam with a log across their chests.<sup>2</sup>

(b) On the Darling (145° 50') Mitchell saw a man floating down the stream on bark.<sup>3</sup> Near Delambre Island (117° E.) Gregory<sup>4</sup> saw logs of wood shaped like canoes, not hollow but very buoyant, about 7 feet long by 1 foot thick, propelled with the hands only, the legs resting on a little rail of sticks driven in on each side; in this respect it resembles the King's Sound raft depicted by Kent.<sup>5</sup>

At Rosemary Islands<sup>6</sup> (115° E.) the only vehicle is a log, lengthened, if necessary, by pieces fitted on by means of pegs, which cross and bend against each other, so as to form a sort of elastic interlocking connection. The bow is rudely ornamented and attached in the same way but less closely. In using it, the navigator sits astride and paddles with his hands, keeping his feet on the end. (Pl. XI, Fig. 6.)

(c) The raft proper is found on the Gulf of Carpentaria,<sup>7</sup> Lake Alexandrina,<sup>8</sup> and the Lower Murray.<sup>9</sup>

Flinders states that at Melville Island (131° E.) they have rafts only, but this, too, seems highly improbable.<sup>10</sup> At Patterson Bay (131° E.) Stokes saw a raft formed of small bundles of wood lashed together (cf. Pl. XI, Fig. 3), on which were two women and several children.<sup>11</sup> At Allen's Island (17° 5' × 139° 26' E.)<sup>12</sup> Flinders saw rafts of straight mangrove branches, very much dried, and lashed together in two places with the larger ends one way, so as to form a broad part, and the smaller ends ran to a point, and towards the other end was a bundle of grass on which the navigator sat. King<sup>13</sup> describes and figures a similar construction from Hanover Bay (124° 47'), consisting of five mangrove stems lashed to a frame of smaller wood (Pl. XI, Fig. 7); it was buoyant enough to carry two natives with their spears and baskets. Not unlike this is the raft, described by Kent, from the Kimberley district<sup>14</sup> (123° E.). It is triangular and formed of poles of the Cyprus pine (? *Frenella robusta*) fastened together with wooden pegs and supplemented by a few vertical sticks at the wider end, between which are impaled the fish (Pl. XI, Figs. 1, 2). At Roe's group<sup>15</sup> in the immediate neighbourhood, Stokes saw a raft of nine small poles (Pl. XI, Fig. 5), 10 feet by 4 feet (3 m. × 1.2 m.); it was pegged together, and the greatest diameter of the largest pole was 3 inches. The whole raft could be carried by one man with ease.

At the mouth of the Gascoyne River (25° S. 114° E.) a raft was discovered in a mass of driftwood by Lieut. Austin<sup>16</sup> in 1851. It was a light log, 11 feet (3.3 m.)

<sup>1</sup> 53, 346.      <sup>2</sup> 44, ii, 16.      <sup>3</sup> 34, i, 220.      <sup>4</sup> 17, 56.      <sup>5</sup> 26, 8.      <sup>6</sup> 28, i, 38, 43.

<sup>7</sup> 53, 304; 55, 1858, 152; 56, 1881, 229.      <sup>8</sup> 1, i, 90.      <sup>9</sup> 43, 75.      <sup>10</sup> 14, ii, 154.

<sup>11</sup> 44, ii, 16.      <sup>12</sup> 14, ii, 37.      <sup>13</sup> 28, ii, 69.      <sup>14</sup> 26, 8.      <sup>15</sup> 44, i, 112.      <sup>16</sup> 55, xxvi, 271 n.

long and 10 inches (25 cm.) in diameter. At one end it was curved to an angle of  $160^\circ$ , and pegs were driven in on each side of this end, on which were two layers of small twigs bound up with bark, forming a basket like a dish, about half the length of the raft.

A portion of a similar one, 6 feet (1.8 m.) long, was found by Phillips on Babbage Island at the mouth of the Gascoyne in 1855. There is thus every probability that they had come down the river.

At Bathurst Island ( $131^\circ$  E.) the raft was the same as at Roe's group save that small pieces were inserted between each pole so as to make the flooring almost smooth.<sup>1</sup> In the large end six pegs formed a kind of basket in which were means of procuring fire, etc. East of this, near the same island, Stokes saw a three-stemmed mangrove trunk,<sup>2</sup> 18 feet by  $4\frac{1}{2}$  feet (5.5 m.  $\times$  1.3 m.), in use as a raft; the roots formed a sort of gunwale at the bows, and an elbow in the trunk served the same purpose at the stern; a platform of small poles covered with dry grass formed the floor. On the Glenelg,<sup>3</sup> and sometimes at Roebuck Bay, three or four mangrove sticks 6 or 7 feet long (1.8 m.—2.1 m.), are pegged together with pine.<sup>4</sup> The ends of all the sticks are carefully sharpened, as in King's illustration, and only poles of a suitable curvature seem to be selected. About the middle, a pine pin, projecting 6 or 7 inches on either side, formed a support.

Rafts are recorded from  $17^\circ 12' \times 146^\circ$  by Brierley. On Lake Alexandrina the raft was of reeds and was used for voyages of miles by eight or ten women; on the Lake Murray timber and reeds were used together.<sup>5</sup>

*Propulsion.*—At Patterson Bay the raft was pushed by swimmers;<sup>6</sup> on the Fitzroy a spear was used.<sup>7</sup> The frontispiece of King's second volume shows the same method; Martin<sup>8</sup> saw this method on the Glenelg, Kent in King's Sound, although his photograph shows a paddle;<sup>9</sup> in the latter district a double-bladed paddle was sometimes used.<sup>10</sup> On Sweers Island ( $139^\circ 40'$  E.) a mangrove paddle is used.<sup>11</sup> On Lake Alexandrina a pole 20 feet (6 m.) long was used.<sup>12</sup>

## II. CONCLUSIONS.

If we exclude the raft as a contrivance likely to be discovered by any savage tribe in the neighbourhood of water, provided timber were not altogether absent, we are still confronted with the problems of the indigenous or foreign origin of the two types of bark canoes, and the two types of dug-outs. The question of the extent of the areas at different dates is naturally important, but cannot be dealt with owing to lack of material.

Dr. Howitt<sup>13</sup> holds that the Australians, like the Tasmanians, reached their country by land. This is in itself by no means improbable, but perhaps the argument from canoes is less weighty than it appears at first sight. It is true that a large area in Australia is without means of navigation, and Dr. Howitt lays stress on the

<sup>1</sup> 44, i, 175.

<sup>2</sup> *Ib.*, i, 173.

<sup>3</sup> 33, 25, 86.

<sup>4</sup> 53, 304.

<sup>5</sup> 1, i, 90; 43, 75.

<sup>6</sup> 44, ii, 16.

<sup>7</sup> *Ib.*, i, 149.

<sup>8</sup> 33, 25.

<sup>9</sup> 26, 8.

<sup>10</sup> 44, i, 112.

<sup>11</sup> Figured in Edge-Partington, iii, 95.

<sup>12</sup> 1, i, 90.

<sup>13</sup> 21, 9.

fact that no instance has ever been recorded of a people losing the art of navigation. But we have no history of uncivilised peoples untouched by civilisation, and the art of navigation among civilised peoples is vastly different from the art of navigation among the Australians. There does not appear to be any good reason why the Arunta, to take a concrete example, should not have lost the art of navigation if they passed from the north coast southwards. They certainly have no canoes and are probably seldom in need of one. If the Arunta were, by force of economic conditions or hostile pressure, forced westwards and southwards till they reached the sea, it is improbable that, whatever their ancestors may have done, they would be in a position to manufacture a canoe; they might not even retain a tradition of the existence of means of navigation, and would thus have to invent the raft or canoe for themselves.

It is no improbable theory that the west and south-west of Australia were peopled by a continental and not a coast route. It is true that the circumcision and *mica* operation areas do not extend right up to the west coast, but there is nothing to show that the coast tribes were not an offshoot of the tribes of the Eastern area, split off from them, possibly, by an irruption of the central group. If there is a mixture of races in Australia, it would be in the nature of things that some of the first inhabitants should be driven to the coast. If this did in fact happen, there is no reason to suppose that a tribe, emigrating from a comparatively waterless central area, would carry with it the knowledge of canoes, even if their ancestors had reached the continent originally by water and not by land. The ignorance of means of navigation therefore is hardly conclusive.

Dr. Howitt argues that the Tasmanians can never have reached Tasmania by water, much less Australia, their bark rafts being unequal to a sea voyage. Now it is true that the authorities cited in Ling Roth's *Tasmanians* agree that the natives as a rule undertook their voyages only in calm weather; but no statements as to the seaworthiness of their bark canoes are available. It by no means follows that because they appear rude they are not rough weather crafts. In this connection it may be of interest to recall the close resemblance in form between the canoes of the Seri Indians and those of the Tasmanians. The former are, it is true, of cane, and therefore more buoyant perhaps, as well as longer; but the usual means of propulsion are the hands, shells, or the harpoon shaft.<sup>1</sup> If the Seri with their cane canoes can navigate the stormy strait of El Infernillo with its continual tide-rip, it does not seem out of the question that the Tasmanians should have reached Australia by the sea and not by land. The bark canoes of the Australians do not seem to our eyes particularly safe craft, but they navigate them for miles; and the Anula canoe is reported to be safe in a moderate sea.

It is noteworthy in connection with the Tasmanian canoes that there appear to be in use, at two different points in Australia, canoes of a type closely resembling those of the Tasmanians. It is of course possible to maintain that they are independent developments, due to similarity of local conditions. It does

<sup>1</sup> 58, xvii, 2, 215\*-220\*.

not however appear at all impossible that the partial identity of the Tasmanian and Australian canoes is due to the fact that they were evolved and spread over this large area before the Tasmanians passed into Tasmania. It may indeed be argued that canoes are known only in the south of Tasmania and that this points to their being known previously to the separation of this island. But clearly if the knowledge of the craft had spread over all the undivided continent, it would not have taken long to pass round the shores of Tasmania.

Passing now to the ordinary whole-sheet bark canoe, it seems on the whole probable that it is an Australian invention. There is no trace in New Guinea of any such form.

The problem of the sewn bark canoe is more difficult. On the one hand, it is a widely distributed type, and its possession by the Fuegians is evidence that no very high culture is needed before it is evolved. Again it is a very natural development from the whole-sheet bark canoe with sewn ends; for nothing would be more probable than that accident or conscious attempt at improvement should evolve from this type the "multiple" sewn bark canoe (in two, three, or more pieces). We find in fact the beginnings of the change in Victoria in the big canoes. On the other hand, the proximity of other areas in which the sewn bark or wood canoe is found suggests that it may after all have been an imported idea; and this view is borne out by its limitation to the northern portion of the continent.

When we turn from the bark canoe to the dug-out, we find the problem complicated by the question of whether, as some authorities affirm, an aboriginal type was in use in the north at Port Essington before the Malays began to trade canoes to the natives. If a smaller Australian type was really in existence, this fact, combined with the presence of the dug-out outside the area of the outrigger in the middle of the last century at two remote points on the east, might suggest that the dug-out came *via* Torres Straits, preceding the outrigger, which has undoubtedly reached the continent by this route. It is unfortunate that Bennett, upon whose personal evidence entire reliance can be placed, gives us no more details of the dug-out of the Blue Mountains, or Angas of this type further north; their occurrence in this area at all is of course a curious phenomenon; for it does not appear from either of the two authorities that these canoes were in use on the coast. Again, the absence of detail suggests that both authorities may be relying on hearsay evidence, and that their description really applies to an outriggered canoe; but against this must be set the complete absence of evidence that the outrigger was ever in use so far south.

There is, however, but little ground for supposing that the dug-out of the Blue Mountains is not of native Australian origin. The extremely limited area from which it has been reported suggests indeed that it has been ousted by a superior or more convenient type. If this were so its former extension was clearly northwards and not southwards, for in spite of the ease with which it is manufactured, it is hardly probable that the whole-sheet canoe would displace the dug-out. On the other hand, the sewn bark canoe may well have done so; and

we have found this type, at various points on the coast in the area between the Blue Mountains and the most southerly point of the outrigger, in the middle of the last century. At the same time it must not be overlooked that the whole-sheet bark canoe also occurs in this area, in fact right up to the boundary of the outrigger. But in dealing with these questions we must not overlook the question of function; it may well be that the bark canoe has survived, as indeed is indicated by the capacity of the whole-sheet canoes, for use by one or two persons, whereas the sewn bark type, and still more the outrigger, demands for its propulsion the efforts of a larger number.

In the absence of expert evidence it is difficult to say what are the relative figures of merit of sewn bark, dug-out and outrigger, including in the figure, of course, marks for ease of construction and durability. If, however, the simple dug-out occupies the last place, it is a possible theory that it formerly had a wider extension, and was ousted by the sewn-bark type. But if the sewn-bark ousted the dug-out, *a fortiori* should it not have ousted the whole-sheet bark canoe, which it has not done? On the whole, therefore, the dug-out of the south-eastern area seems to be a local phenomenon.

The problem of the outrigger is comparatively a simple one. The double outrigger is reported as far south as lat.  $13^{\circ}$ ; 60 miles further south we find the single outrigger. We may therefore fairly assume that the boundary at the date in question lay between these two points. Not only is the outrigger not reported in the middle of the last century from any point outside the peninsula, but it is expressly stated to be a poor copy of the craft of Torres Straits. Everything therefore points to the Papuan origin of this form of canoe.

The single outrigger which obviously preceded the double form, extends as far as  $18^{\circ} 13' S.$  on the east coast, thus overlapping the area of the bark canoe. By simple inspection we arrive at a Papuan origin for the outrigger.

A point of much interest in connection with this question I am compelled to pass over for lack of information, though it might throw light on one question, if not on more. This is the method in which the float is attached to the boom. That the method shown in the Cairns canoe differs from that at present in use in Torres Straits does not, of course, disprove the Papuan origin of the outrigger. The Torres Straits method may well be a later improvement. I hope to undertake at some future time a comparison of the methods used in Australia, New Guinea, Melanesia and Polynesia.

#### NAMES OF AUSTRALIAN CANOES.

The following list, based on the vocabularies in Curr's *Australian Race* is roughly sorted according to whether (1) only European boats are found; or (2) no boats are found at all; and (3) according to the kind of native boat in use in the locality. It may be noted that there is no direct information as to the use of the canoes in many of the inland areas included in Table IV, the Riverina, of course, excluded. The numbers are those assigned by Curr:—

TABLE I.—NAMES OF EUROPEAN (?) BOATS. WEST AND CENTRE.

PLACE OR TRIBE.	NAME.
10. Nichol Bay ... ..	<i>yowarda.</i>
15. Champion Bay ... ..	<i>kewardie.</i>
24. Geographic Bay ... ..	<i>kibera.</i>
48. <sup>1</sup> Cooper's Creek ... ..	<i>uko bichi.</i>
50. " " (near Bulloo) ... ..	<i>ngumboo.</i>
53. <sup>1</sup> Lower Bulloo ... ..	<i>boorlee.</i>
55. <sup>1</sup> <i>Dieri</i> .. ... ..	<i>pirra.</i>
63. <sup>1</sup> Gawler Range ... ..	<i>yoota.</i>
65. <sup>1</sup> Mount Remarkable ... ..	<i>youkou.</i>
67. Yorke's Peninsula ... ..	<i>jukkoo.</i>
68. Adelaide ... ..	<i>bokka</i> (= bark) <i>yoko</i> ( <i>yoko</i> = bark at Cooktown).
69A. <sup>2</sup> N.W. Corner of New South Wales ... ..	<i>pulturoo.</i>
90. Burketown (17° 30' S., 139° 40' E.)	<i>kamera.</i>
92. Mouth of Norman ... ..	<i>nye.</i>
93. Midde ... ..	<i>orukkur.</i>
99. Cloncurry ... ..	<i>nungkore.</i>
153. <sup>2</sup> Barcoo ... ..	<i>wogara.</i>
154. " ... ..	<i>doombatung.</i>
155. " ... ..	<i>weeter, tangin, oorun.</i>

TABLE II.—NAMES OF BARK OR DUG-OUT CANOES. NORTH COAST.

PLACE OR TRIBE.	NAME.
1. Port Darwin ... ..	<i>gūnoogara.</i>
2. <i>Woolna</i> (Adelaide River) ... ..	<i>maltigia moerty.</i>
or <i>Limba Karadja</i> (Port Es-	
sington) ... ..	<i>lippee-lippee.</i>
3. <i>Unalla</i> (Raffles Bay) ... ..	<i>oboen.</i>

TABLE III.—NAMES OF OUTRIGGER CANOES. NORTH QUEENSLAND.

7. <i>Gudang</i> (C. York) ... ..	<i>angania.</i>
108. P. Charlotte's Bay ... ..	<i>tandi.</i>
109. Endeavour River ... ..	<i>marigau, marigan.</i>
110. Weary Bay ... ..	<i>berongaboy.</i>
116. Head of Walsh ... ..	<i>murregan.</i>

Edge-Partington<sup>3</sup> gives *patchie* as the name in the Cairns district.  
Phillips<sup>4</sup> gives *wangga* and *marrakan* for Cooktown.

<sup>1</sup> No boats are used in this locality, so far as is known.

<sup>2</sup> No native canoes are used in these localities.

<sup>3</sup> MS. note.

<sup>4</sup> 54, xxvii, 144.

Roth<sup>1</sup> gives the following words for the canoe and its parts in the Koko Yimindir language:—

<i>Wang-ga</i>	...	...	...	canoe.
<i>Darman</i>	...	...	...	outrigger (? float).
<i>Bantchau</i>	...	...	...	body.
<i>Wakka</i>	...	...	...	bow.
<i>Gorumon</i>	...	...	...	stern.
<i>Kanna-kanna</i>	...	...	...	crosspieces.
<i>Tabul</i>	...	...	...	boom.
<i>Yirinbar</i>	...	...	...	two washboards locked on gunwale.
<i>Biribe</i>	...	...	...	paddle.

TABLE IV.—NAMES OF BARK CANOES. RIVERINA.

	PLACE OR TRIBE.		NAME.
75.	Bourke, Darling River	...	<i>bültärü</i> (tulkaru = bark).
76.	Fifty miles lower	...	<i>bülyunga</i> .
78.	Tintinaligi, Darling River	...	<i>butherop</i> (baltha = bark).
79.	Weinteriga	...	<i>pulteru</i> (palta = bark).
80.	Menindie	...	"
82.	<i>Marowera</i> , Murray River	...	" , <i>bankoom</i> .
83.	Pytu Reach	...	<i>meralti</i> .
84.	Wellington	...	<i>manno</i> .
85.	N.W. bend of	...	"
86.	Ned's Corner	...	<i>nunga</i> .
87.	<i>Kemendoh</i>	...	<i>longup</i> .
88.	<i>Yittha</i>	...	<i>yongni, kokwunk</i> .

See below, Nos. 204, 208B, etc.

EAST COAST, QUEENSLAND.

118.	Hinchinbrook Island	...	<i>woolgo</i> .
119.	Herbert River	...	"
120.	Halifax Bay	...	"
124.	Cleveland Bay	...	<i>oolgaroo</i> .
	"	...	<i>wooro</i> .
125.	Mount Elliot	...	<i>woolgoora</i> .
126.	Mouth of Burdekin	...	<i>karbeyal</i> .
131.	Cape River	...	<i>kooga</i> .
133. <sup>1</sup>	Mount Black	...	<i>oolkooro</i> .
134.	Lake Burdekin	...	<i>kobbetheba</i> .
	"	...	<i>bettel-bettel</i> .
136.	Port Denison	...	<i>vinda</i> .
143.	Belyando River	...	<i>warella</i> .
	"	...	<i>balgoo</i> .

<sup>1</sup> Bull. No. 4.

	PLACE OR TRIBE.		NAME.
145.	<i>Aminungo</i> ... ..		<i>winda</i> .
147, 148.	Port Mackay, Broad Sound ... ..		"
149.	Rockhampton ... ..		<i>andool</i> .
150.	Lake Dawson, etc. ... ..		<i>tandool</i> .
153.	Barcoo, see Table I.		
156.	Nogoa River ... ..		<i>weanda</i> .
157.	Comet River ... ..		<i>kooga</i> (= bark).
158.	Brown River ... ..		"
159.	Dawson River ... ..		<i>boonde</i> .
	" " ... ..		<i>gundoa</i> (= bark).
	Burnett River ... ..		<i>goondu</i> (= bark).
161.	Boyne River ... ..		<i>kooga</i> .
163.	Baffle Creek ... ..		<i>kundole</i> .
164.	Moreton Bridge (N. side) ... ..		<i>kumba</i> (= bark).
	Maryborough ... ..		<i>kolaro</i> .
	Near Brisbane ... ..		<i>kumbar</i> (= bark).
	Fraser's Island ... ..		<i>kooloro</i> .
165.	Upper Burnett ... ..		<i>kundool</i> .
166.	<i>Kabi</i> ... ..		<i>kambar</i> (cf. 164).
167.	Upper Brisbane ... ..		<i>koondoo</i> (= bark).
168.	<i>Turribul</i> ... ..		"
169.	Condamine ... ..		<i>kundung</i> (tundo = bark).
170, 171.	Stradbroke Island ... ..		<i>koondool</i> (koonjool = bark)
172.	Berang Creek, etc. ... ..		—
170.	Moreton Island ... ..		<i>oobum</i> .

## NEW SOUTH WALES.

175.	Balonne River ... ..		<i>boondurra</i> .
176.	<i>Bigambul</i> ... ..		<i>gillee</i> (= bark) <i>welbon</i> .
177.	Mungalella Creek ... ..		<i>kooka</i> .
178.	Richmond River... ..		<i>burcool</i> .
	Ballina, etc. ... ..		<i>kindul</i> .
180.	Queenbulla ... ..		<i>walkia</i> .
181.	Namoi ... ..		<i>kumbilgal</i> .
	Namoi ... ..		<i>wyardka</i> .
182.	Culgoa ... ..		<i>toongoon</i> (= bark).
183.	<i>Wailwan</i> ... ..		<i>mungar</i> .
184.	Clarence River ... ..		<i>bakool</i> , <i>wolloo</i> .
185.	Lake Macleay ... ..		<i>woi</i> .
187.	Manning River ... ..		<i>kooyauk</i> (koorak = bark).
188.	Hunter River ... ..		<i>buba</i> .
189.	Hawkesbury River ... ..		<i>nooia</i> .
190.	Warren, New South Wales ... ..		<i>murrin</i> (= bark); <i>wargin</i> , <i>warrung</i> (doorong = bark).
	Bathurst ... ..		<i>kogee</i> .

	PLACE OR TRIBE.				NAME.
	Bogan River	...	...	...	<i>mure.</i>
	Deniliquin	...	...	...	<i>koonadan.</i>
191.	Port Jackson	...	...	...	<i>nowey.</i>
192.	Botany Bay	...	...	...	<i>yernerera.</i>
193.	Shoalhaven	...	...	...	„, <i>mudyeri.</i>
194.	Jervis Bay	...	...	...	<i>kurridja.</i>
196.	Queanbeyan	...	...	...	<i>murring.</i>
197.	Moneroo	...	...	...	<i>mamat.</i>

## VICTORIA.

199.	Swan Hill	...	...	...	<i>unkooi.</i>
201.	Piangil	...	...	...	<i>yungobi.</i>
202.	Bumbang, Murray River	...	...	...	<i>longoi.</i>
204.	Tatiarra	...	...	...	<i>yongoe.</i>
205.	Mount Gambier	...	...	...	<i>wola, bēm, woggo.</i> <sup>1</sup>
207A.	Lake Hindmarsh	...	...	...	<i>yoongooip.</i>
207C.	Upper Glenelg	...	...	...	<i>torong</i> (= bark).
207D.	Glenelg	...	...	...	<i>ngnanak</i> (= bark).
207E.	Woodford	...	...	...	<i>wowwo.</i>
207G.	Hamilton	...	...	...	<i>yaongalo.</i>
207H.	Mount Rouse	...	...	...	<i>yowargalook.</i>
207I.	Lake Condah	...	...	...	<i>tholong.</i>
207J.	Hopkins River	...	...	...	<i>torong</i> (= bark).
208A.	Moulmein	...	...	...	<i>yungwitch.</i>
208B.	Lake Boga	...	...	...	<i>yungoot.</i>
208J.	Moorabool	...	...	...	<i>korong, yaoot.</i>
209A.	<i>Ngooraialum</i> , etc.	...	...	...	<i>kōrom.</i>
210.	Gippsland	...	...	...	<i>gre, yuro.</i>
211.	Omeo	...	...	...	<i>worbang</i> (worogang = bark).
213.	Upper Murray	...	...	...	<i>moutha.</i>
214.	<i>Bangerang</i> , etc.	...	...	...	<i>māttha, matta.</i>
214D.	Yiilima	...	...	...	<i>bootjo.</i>

In a MS. vocabulary at the Anthropological Institute boat is translated thus:—

Bacchus Marsh	...	...	...	<i>yowwulaí wok.</i>
Melbourne	...	...	...	<i>goorrung.</i>

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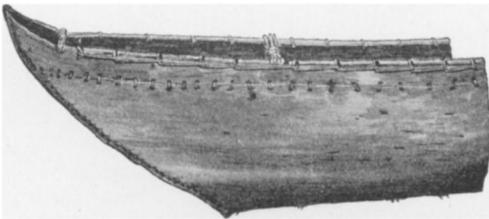


*Howitt: "Tribes of S.E. Australia, p. 424."*

**FIG. 1.—KURNAL, BARK CANOE, VICTORIA.**



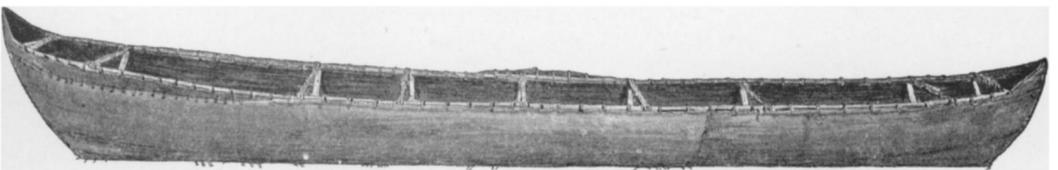
**FIG. 2.—CROSS SECTION.**



**FIG. 3.—BOW.**



**FIG. 4.—PADDLE.**



**FIG. 5.—BARK CANOE OF ANULA TRIBE.**

*Figs. 2-5. Spencer and Gillen, "Northern Tribes of Central Australia."*

*Reproduced by the courtesy of Messrs. Macmillan & Co.*

**AUSTRALIAN CANOES AND RAFTS.**

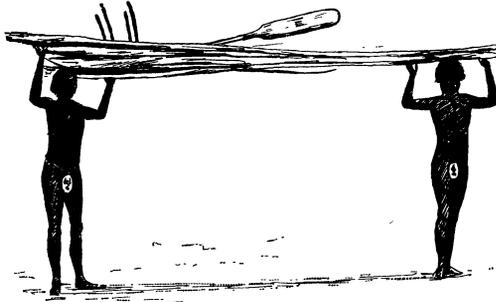


Fig. 1 Natives carrying Raft.

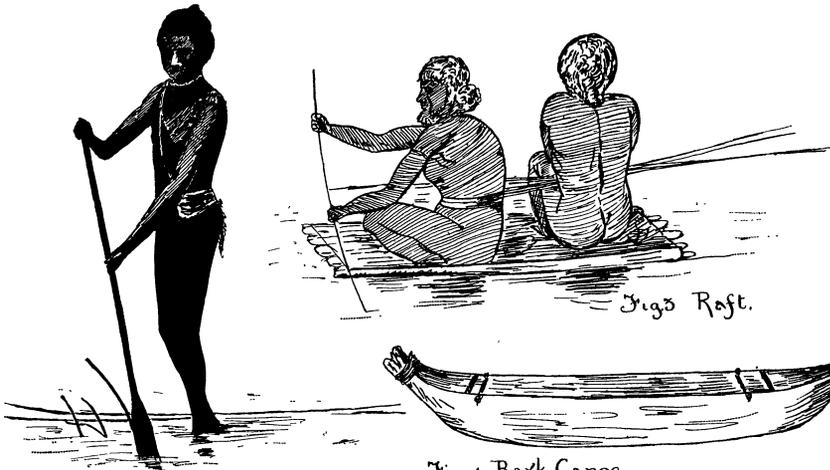


Fig 2 Raft

Figs Raft.



Fig. 4. Bark Canoe,

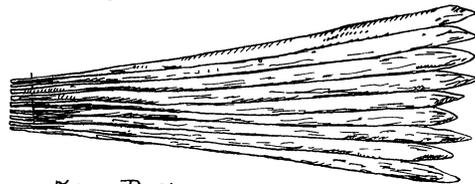


Fig. 5. Raft.



Fig 6 Log of Wood used as a raft

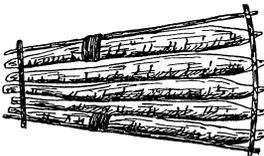


Fig. 7. Raft.



Fig. 8. Canoe.

Figs. 1 and 2. King's Sound. Fig. 3. N.W. Australia. Fig. 4. N.S.W. Fig. 5. Roe's Group, N W. Australia. Fig. 6. Rosemary Islands, N.W. Australia. Fig. 7. Hanover Bay. Fig. 8. Wessel Islands.

AUSTRALIAN CANOES AND RAFTS.

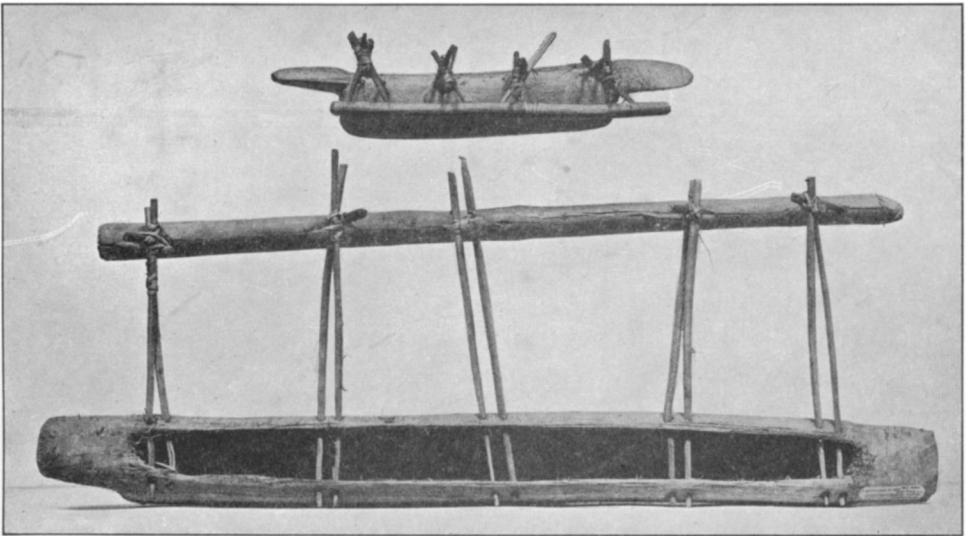


FIG. 1.—OUTRIGGER CANOE, CAIRNS DISTRICT, QU.

*British Museum.*

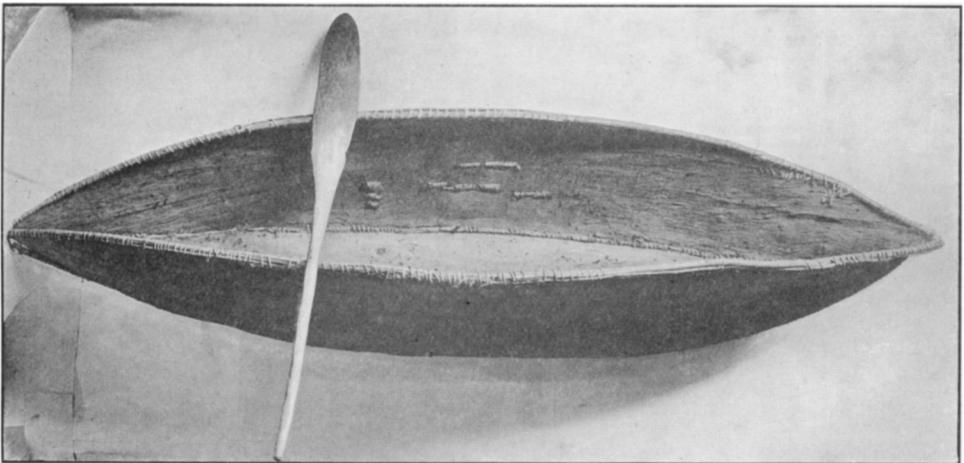


FIG. 2.—BARK CANOE, PORT DENISON, QU.

*Museum f. Völkerkunde, Berlin.*

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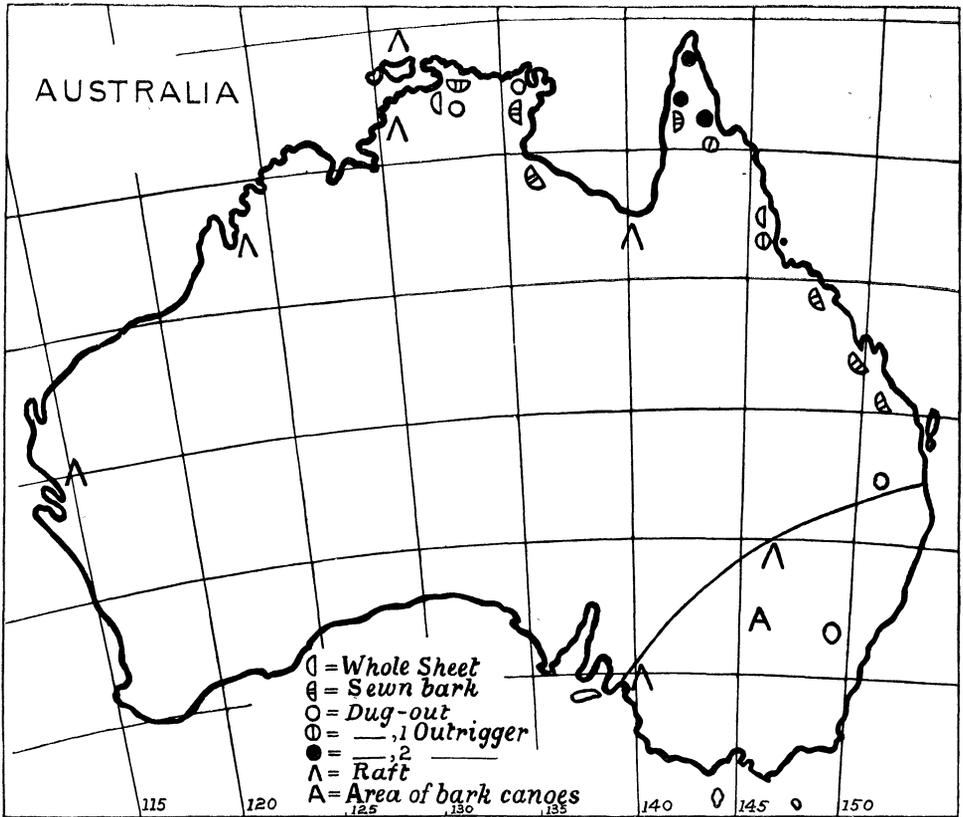


FIG. 3.

*Description of Figures in Text.*

- Fig. 1. Bark canoe, with mud in ends, from Brough Smyth.
- Fig. 2. Bark canoe in Pitt Rivers Museum, Oxford.
- Fig. 3. Map showing distribution of canoes and rafts.

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